

## Guidance and Accuracy Performance of Low Ballistic Number Vehicles

For entry into Earth, Mars and other planetary bodies, there is general interest in managing aero-heating by reducing the ballistic number of the entry vehicle. This can be accomplished by many techniques, but most recent work has focused on inflatable heat shields. Such systems manage aero-heating by reducing the ballistic number into the region of  $10\text{-}30\text{ kg/m}^2$ . Such systems design decelerate quickly in the atmosphere at altitudes above previous entry experience and closer to the altitudes of aero-braking maneuvers. Under such trajectory performance limits in accuracy, as measured by ellipse size on the surface, may be encountered. This work looks at what limits on accuracy can be expected for ballistic unguided and guided (drag modulating and lifting) vehicles as a function of vehicle ballistic number and basic assumptions of planetary atmospheric density models. Simulation results and comparison with previous Mars flight experience with aero-braking and entry accuracy performance will be cited.